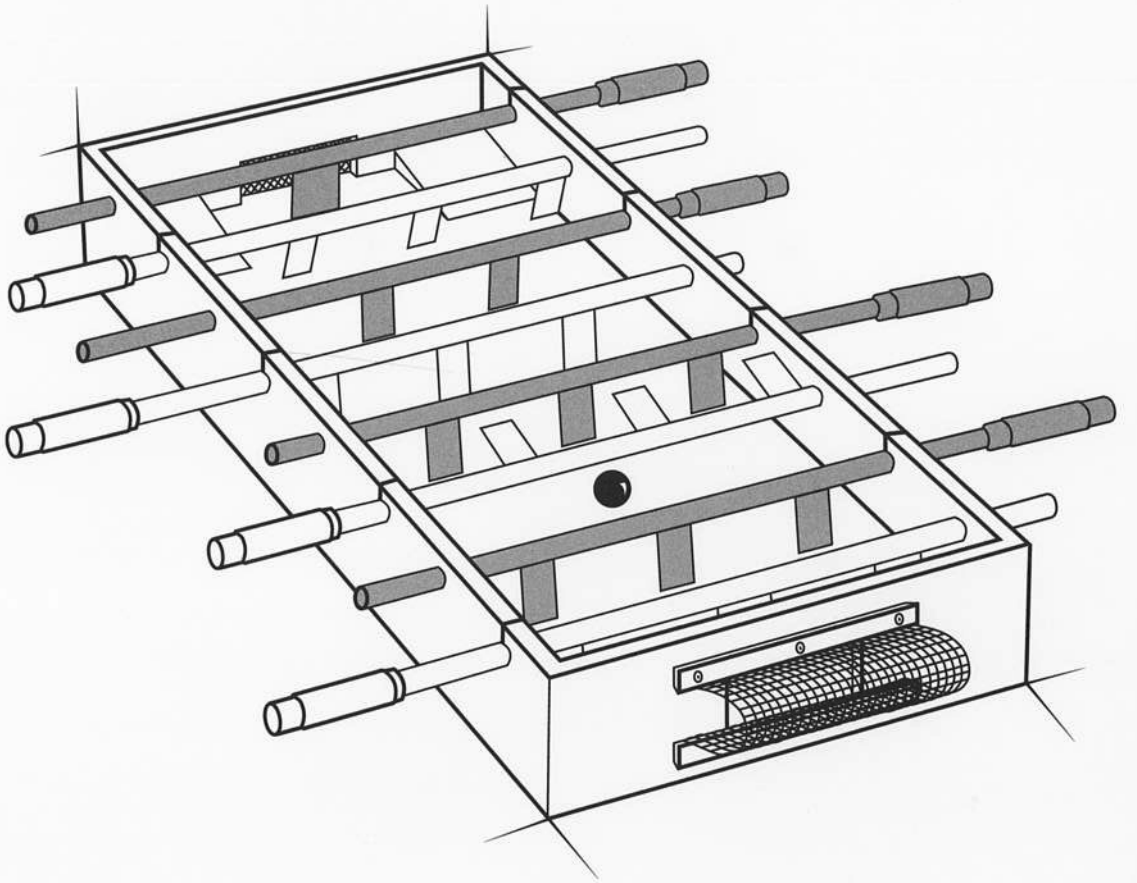
MINWAX

WOODWORKS: INTERMEDIATE PROJECT 2002-2003

TABLETOP SOCCER



If you like fast-action fun, here's a homemade foosball game that'll give everyone hours of enjoyment.

- Its hardwood construction is tough enough for lots of overtimes, and when the game is finally over, it stores compactly. Just slip out the dowel rods, put them inside the box, and set the game on a shelf.
- To make the game easier to build, you can devise a jig that simplifies the difficult task of attaching the rectangular players and goalies to the dowel rods.
- To save you some legwork, the Shopping List tells where to get some of the harder-to-find pieces, but you'll find almost everything else you need at a home center or lumberyard.

This game gives intermediate woodworking students the opportunity to learn a number of important, basic skills, including measuring, cutting, marking, drilling, routing, gluing, clamping and mitering. And after you build it, you'll learn how to apply and use finishes to protect the wood and keep it looking beautiful.

TOOLS REQUIRED

Hand Tools
- Two 4′ bar clamps
- Two 6″ C- or other small clamps
- Screwdriver
- Combination square

Power Tools
- Table saw and dado blade
- Scroll or saber saw
- Router with a 1/4″ straight bit
- Belt sander with a 60-grit or coarser sanding belt
- Electric drill, 13/16″ spade bit, and a 3/8″-dia. plug cutter
- Hot-glue gun

Miscellaneous
- Pencil
- Safety glasses
- Carpenter's glue
- Gloves for finishing
- Sandpaper
- Clean, lint-free cloths
- Mineral spirits (for oil-based finishes)
- Water-filled metal container with tight-fitting lid
- Minwax® Polycrylic® Brush, or good quality synthetic bristle brush for Water-Based Stains and Finish, or Minwax® Wood Finish™ Stain Brush, Minwax® Polyurethane Brush or good quality natural bristle brush for oil-based stains and finishes.

SHOPPING LIST

Item	Quantity
1″ x 6″ x 8′ oak	2
3/4″ x 24″ x 48″ oak plywood	1
3/4″ dia. x 36″ birch or maple dowels	4
3/4″ dia. x 36″ walnut dowels	4
1/4″ dia. x 9-1/2″ birch dowel	1
1-1/4″-dia. birch ball	1
No. 6 x 1-1/4″ drywall screws	12
No. 6 x 3/4″ brass flathead screws	12
non-skid rubber feet with screws	6
rubber hand grips	8
12″ x 24″ nylon mesh netting	1

Note on Materials: Look for the hardwood dowels and ball at woodworking specialty store. Non-skid rubber feet and nylon mesh netting are available at home centers and hardware stores, and a local bicycle store will have the hand grips.

CUTTING LIST

Key	Pcs.	Size & Description
A	2	3/4″ x 5-1/2″ x 41″ oak (sides)
B	2	3/4″ x 5-1/2″ x 18″ oak (ends)
C	4	3/4″ x 4″ x 5″ oak (ramps)
D	2	1/4″ x 2″ x 2-1/2″ oak (goalies)
E	18	1/4″ x 1-1/4″ x 2/1/2″ oak (players)
F	4	1/4″ x 3/4″ x 9″ oak (net supports)
G	4	3/4″ dia. x 29″ birch dowels (player/goalie rods)
H	4	3/4″ dia. x 29″ walnut dowels (player/goalie rods)
J	4	1/4″ dia. x 1″ birch dowels (goalie rod stops)
K	1	3/4″ x 17″ x 41″ oak plywood (playing field)
L	1	3/4″ x 7″ x 20″ scrap plywood (routing jig base)
M	1	3/4″ x 4-5/16″ x 20″ scrap plywood (routing jig rear support)
N	1	3/4″ x 2-1/8″ x 20″ scrap plywood (routing jig front support)
P	1	3/4″ x 1-1/2″ x 20″ scrap plywood (routing jig fence)
Q	2	7″ x 9″ nylon mesh (goal nets; see Shopping List)

WOOD FINISHING PRODUCTS

Recommended Finish

Prep: Minwax® Water-Based Pre-Stain Wood Conditioner

Stain: Minwax® Water-Based Wood Stain*
- Sides and Ends: in Honeydew
- Base & Ramps: in Green Tea
- Walnut Rods, Players & Goalie: in Wild Berry
- Birch or Maple Rods, Players & Goalie: in Natural Beige
- Ball: White Oak (or any color you prefer)

*(or a Minwax® Water-Based Wood Stain of your choice, available in six wood tones and 60 custom colors)

Finish: Minwax® Polycrylic® Protective Finish Satin

Alternate Finish

Stain: Minwax® Wood Finish™ **
- Sides and Ends: Golden Oak
- Base & Ramps: Golden Oak
- Walnut Rods, Players & Goalie: Special Walnut
- Birch or Maple Rods, Players & Goalie: Ipswich Pine
- Ball: Minwax® Wood Finish™ Pickled Oak

**(or your choice of 18 Minwax® Wood Finish™ Stain colors)

Finish: Minwax® Fast-Drying Polyurethane Satin

BEFORE YOU BEGIN

Good craftsmanship begins and ends with good work habits, so make the following steps part of your routine workshop practice. If you have any doubts or questions about how to proceed with a project, always discuss them with your shop instructor.

- Carefully and fully review plans and instructions before putting a tool to the project lumber.
- Work sensibly and safely. Wear safety goggles when doing work that creates flying chips and sawdust; wear the appropriate respirator whenever making sawdust or working with thinners or other solvents.
- At the end of every work session, clean up your shop area and put away all portable tools.

CUTTING AND ASSEMBLY PROCEDURE

1. Cut pieces A through C and pieces F through Q to the dimensions given in the Cutting List. The goalies (D) and players (E) will be cut to fit into the goalie/player dowel-rod grooves later. When you cut the goal nets (Q), follow the weave of the mesh to help cut square pieces.

2. Lay out and drill the rod holes in the sides (A). Counterbore and drill the drywall screw holes in the ends (B), and drill the screw holes in the net supports (F).

3. Using a table saw fitted with a dado blade, cut the grooves in the side and end pieces (A and B), then cut the rabbets on the outside edges of the end pieces. Set the fence so the rabbets will be 3/4″ wide.

How To Cut A Wedge

Here's a fast and simple way to cut the plywood routing jig wedge using your table saw. Clamp a 50″ auxiliary fence to the table saw's fence. Make a 1/2″ x 3/4″ x 2″ riser block to hold the plywood piece at an angle to the fence. Set the auxiliary fence 3-11/16″ away from the saw blade (use a blade with a 1/8″ kerf blade). Tape the riser block to the plywood so it holds the plywood 1/2″ away from the auxiliary fence and cut off the wedge.

4. Assemble (without glue) the sides, ends and playing field (A, B and K). Take a close look at Figure A, then lay out the 5/16″-wide player/goalie slots for inserting the rods once everything is assembled. Note that the layout is different on each side. To avoid splitting the wood later when you insert the screws, drill pilot holes for the drywall screws that attach the ends to the sides. Then disassemble the parts, and cut the slots with a jigsaw.

5. Lay out and cut the goal holes on the ends (B) with a jigsaw. Start by drilling a 3/8″-dia. hole inside the cutout to insert the jigsaw blade. Smooth the sawn edges with a file.

6. Make the player/goalie groove routing jig next. Start by cutting the sliding wedge off part M, the routing jig rear support (Fig. B). Then glue and clamp the routing jig pieces L through P together as shown in Figure C. This jig is set for a router with a 6″-dia. base. If your router has a different diameter base, glue the routing jig fence (P) to the routing jig rear support (M) so the router bit is centered over the rods (half the diameter of your router's base).We devised this jig to make simple work of cutting straight grooves in dowel rods. It'll not only save frustration, but ensures that the grooves line up straight along the dowel rod. The rod is held tight in the jig by tapping on the wide end of the sliding wedge. Then the base of the router is held against the jig's fence as the router bit is plunged into the rod and the groove is cut. A regular router works fine but a plunge router makes this job easier.

7. Measure and mark the jig routing guidelines relative to the right end of the jig using the dimensions and layout shown in Figure C. Use a combination square to draw the lines across the jig's front support (N).

8. Set a player rod (G) into the routing jig and align the right end of the rod flush with the right end of the jig. Tap the wedge in place with a hammer to hold the rod securely in the jig. Using a combination square, transfer the routing guidelines from the jig to the rod. Rout the three player grooves using a 1/4″ straight router bit. Cut the grooves slightly past the marks drawn on the rod. Do three of the birch rods (G) and three of the walnut rods (H) this way.

9. Using the routing jig again, cut the goalie grooves in the two remaining rods (one groove per rod). Because the goalies are wider than the players, mark the routing end points 3/8″ wider on each side of the center player guidelines. Next, drill the rod stop (J) holes before you remove the goalie rods from the jig.

10. Using a table saw with a regular rip blade, cut the goalies (D) and players (E) to the dimensions given in the Cutting List, and so they fit tight in the grooves cut in the rods.

11. Taper the ramps (C) using a 60-grit or coarser sanding belt in your belt sander as shown in Figure D. Apply a couple of dabs of hot glue to the underside of the ramp pieces to temporarily hold them to a scrap board. Clamp the scrap board to a worktable and sand the tapers. Use a putty knife to "pop" off the tapered pieces from the scrap board.

12. Sand the surfaces of all the parts smooth except the outsides of the sides (A) and ends (B); this will be done later. Start with 120-grit sandpaper, and finish with 180-grit sandpaper.

13. Glue and clamp one side to the playing field (K) and let the glue dry. Then glue and clamp the other side to the playing field. Before the glue dries, glue and screw the ends (B) in place. You may need to loosen the clamps near the edges of the sides in order to get the ends to go on.

14. Cut 12 oak screw cover plugs using a 3/8″-dia. plug cutter. Glue and hammer the plugs into the counterbored drywall screw holes. Now finish-sand the outsides of the side and end pieces.

15. Glue the players, goalies and goalie rod stops (J) into their rod slots. Also glue the ramps into the corners of the playing field. Sand smooth all the sharp edges of all the parts.

16. Attach the net supports (F) and goal nets (Q) over the goals. Predrill the screw holes, then insert the screws through holes in the cloth mesh before fastening the supports to the ends. Then remove the goal nets prior to finishing (see "Staining and Finishing" below).

STAINING AND FINISHING

Woodworker's Tip: *Though you may be tempted to cut short your sanding, preparation and application, don't do it. These tasks are very important steps in obtaining a high-quality finish. Remember, it is the finish, just as much as the fit and smoothness of the parts that will have great bearing on how people judge your craftsmanship. To ensure an excellent result, follow the steps listed below and also the instructions the finish manufacturer puts on its products.*

FINISHING TIPS

- Use scraps of wood to test the stains and finishes you are planning to use. On the back of the scrap, mark the stain/finish combination and the type of wood. Allow all samples to dry thoroughly before making your final finish selection. Save your samples for quick reference on future projects.
- All stains and finishes must be allowed to dry thoroughly between coats. Remember that drying times can vary due to humidity and other climatic conditions.
- To get additional surface protection, after finishing apply two or three coats of Minwax® Paste Wax. Buff each coat with a clean, stiff fiber brush; after the last wax application and buffing, rub all surfaces with a clean, lint-free cloth.
- If you have some leftover stain or finish, wipe the can rim so that stain or finish in the rim won't dry out and prevent the lid from forming a tight seal.
- Brushes used for oil-based finishes must be cleaned with mineral spirits; for water-based products, such as Minwax® Water-Based Stain and Minwax® Polycrylic® Protective Finish, clean brushes with warm water and soap.

17. For this project, you have the option of finish-sanding and applying stain and finish to some pieces before they're assembled. Whenever you do the sanding, use a pad sander and with-the-grain sanding strokes to remove any marks or scratches that may have occurred during assembly. Start with 120-grit paper and finish with 220-grit. Dust off the piece and wipe it carefully with a cloth lightly dampened with water.

Recommended Finish

18. Apply Minwax® Pre-Stain Water-Based Wood Conditioner, following the directions on the can. After 1 to 5 minutes, wipe off all excess conditioner using a clean, lint-free cloth. Wait 15 to 30 minutes and then use fine-grade paper to sand off any "whiskers" raised by the conditioner. Proceed to the staining within 2 hours.

19. Do the staining in two steps, starting on the interior surfaces and then moving to the exterior surfaces. Apply the Minwax® Water-Based Wood Stain you've chosen to the interior surfaces using either a cloth or a nylon/polyester brush. Allow stain to penetrate no longer than 3 minutes. While stain is still wet, wipe off all excess with a clean cloth that's been lightly dampened with stain. Allow the piece to dry for 2 hours before applying a second coat, if desired. Allow the piece to dry overnight before applying the clear finish.

Woodworker's Tip:
Minwax® Water-Based Wood Stain is available in six factory (wood-tone) colors, a White Wash Pickling Stain and 60 custom colors. This means that you are not limited to just wood colors (pine, oak, walnut, etc.). We chose the colors to replicate the look of a soccer stadium, but you can actually pick and apply your favorite "team" or school colors. For this reason, look over all of the Minwax® color charts before making your final selection.

20. Apply Minwax® Polycrylic® Protective Finish following the directions on the can. Stir the can contents thoroughly before starting and periodically repeat the stirring during your work session.

21. Working a small area at a time to maintain a wet edge, apply the first coat. Work quickly and make the final strokes in each newly finished section using with-the-grain brushstrokes.

22. Allow the finish to dry a minimum of 2 hours. Then sand lightly with 220-grit sandpaper wrapped around a soft backup block. Thoroughly dust off and wipe all surfaces with a cloth lightly dampened with water.

23. Repeat steps 20, 21 and 22 to apply the second coat.

24. Repeat the above steps to apply a third and final coat of protective finish.

Alternate Finish

25. Do the staining in two steps, starting on the interior surfaces and then moving to the exterior surfaces. Apply the Minwax® Wood Finish you've chosen to the interior surfaces using a clean, lint-free cloth. Allow the stain to set for about 5 to 15 minutes then wipe off any remaining excess. Repeat for the exterior surfaces. Allow the stain to dry for 24 hours before applying the finish.

Woodworker's Tip:
When wiping off stain, make certain that your last wipe with the cloth goes with the grain of the wood. This way, any stain you might miss during wipe-off will be visually minimized by the wood grain.

26. Apply Minwax® Fast-Drying Polyurethane following the directions on the can. Use a good quality natural bristle brush intended for use with polyurethane. Allow the first coat to dry overnight.

27. The next day, sand all surfaces lightly with 220-grit paper using with-the-grain strokes. Dust off and wipe all surfaces with a cloth lightly dampened with mineral spirits. Apply a second coat of polyurethane and set the piece aside to cure overnight.

28. The following day, sand all surfaces lightly with 220-grit paper. Dust off and wipe the piece with a cloth lightly dampened with mineral spirits and apply the third and final coat of polyurethane.

29. After the staining and finishing is done, and the piece has cured for several days, screw the rubber feet to the bottom edges of the sides, reattach the goal nets, and hammer the hand grips onto the player/goalie rods. Wrap electrical tape around any dowels that need it to tighten the grips. Slide the player/goalie rods in place, and you're done. Let the games begin!

PRODUCT SAFETY

For your safety and the safety of those you work with, always read the safety warnings, which manufacturers print on their labels, and follow them to the letter. Typical safety advice and instructions will contain information such as the following:

DANGER! MINERAL-BASED PRODUCTS ARE HARMFUL OR FATAL IF SWALLOWED. SKIN IRRITANT. COMBUSTIBLE. KEEP OUT OF REACH OF CHILDREN. DANGER: Contains mineral spirits. Harmful or fatal if swallowed. Do not take internally. Skin irritant. Avoid contact with skin and eyes. Wear rubber gloves and safety glasses when handling. Combustible. Do not use or store near heat, sparks, flame or other source of ignition. Close container after each use. Avoid inhalation and use only with adequate ventilation. If using indoors, open all windows and doors to make sure there is fresh air movement. If you experience lightheadedness, dizziness or headaches, increase fresh air movement or leave the area. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.
FIRST AID: If swallowed: Do not induce vomiting. Call physician immediately.
FOR SKIN CONTACT: Wash thoroughly with soap and water. If irritation persists, get medical attention.
FOR EYE CONTACT: IMMEDIATELY flush eyes thoroughly with water, then remove any contact lenses. Continue to flush eyes with water for at least 15 minutes. If irritation persists, get medical attention.
IF AFFECTED BY INHALATION: Immediately remove to fresh air. If symptoms persist, call physician.

When using Minwax® Polycrylic® Protective Finish:
VAPOR HARMFUL. Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches or dizziness, increase fresh air supply or wear respiratory protection (NIOSH/MSHATC23C or equivalent) or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage.

DO NOT TAKE INTERNALLY.
FIRST AID. In case of eye contact, flush thoroughly with large amounts of water for 15 minutes and get medical attention. For skin contact, wash thoroughly with soap and water. In case of respiratory difficulty, provide fresh air and call physician. If swallowed, get medical attention immediately.

DELAYED EFFECTS FROM LONG-TERM OCCUPATIONAL OVEREXPOSURE.
Contains solvents that can cause permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

SAFE DISPOSAL OF RAGS AND WASTE.
Please be mindful of the safe way to dispose of rags and other waste. Rags, steel wool and other waste products soaked with oil finishes or solvents may spontaneously catch fire if improperly discarded. Place rags, steel wool and other waste immediately after use in a water-filled metal container. Tightly seal and dispose of the waste materials in accordance with local trash removal regulations. Be sure to keep the waste out of reach of children.

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FIG A. TABLETOP SOCCER ASSEMBLY

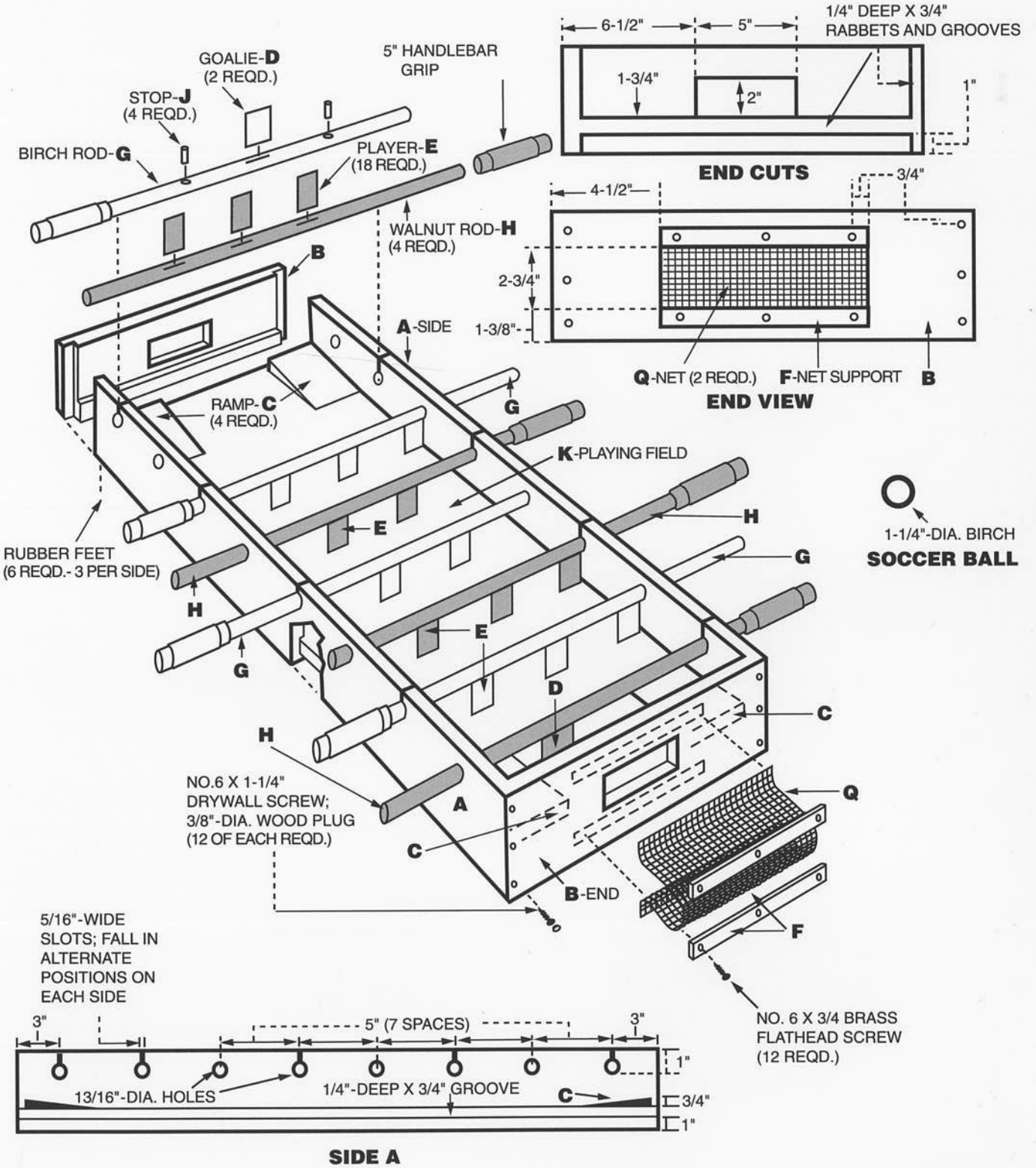

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FIG B. CUTTING THE WEDGE FOR THE ROUTING JIG

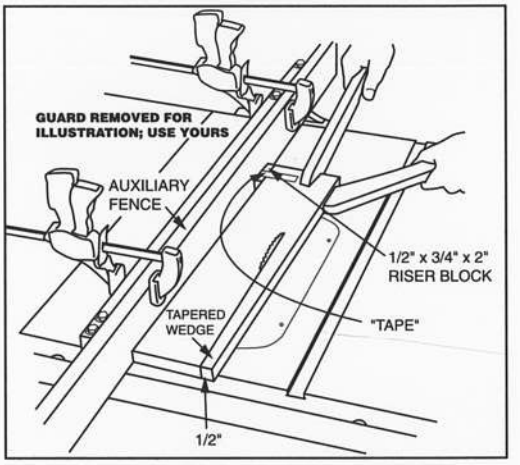


FIG C. THE ROUTING JIG

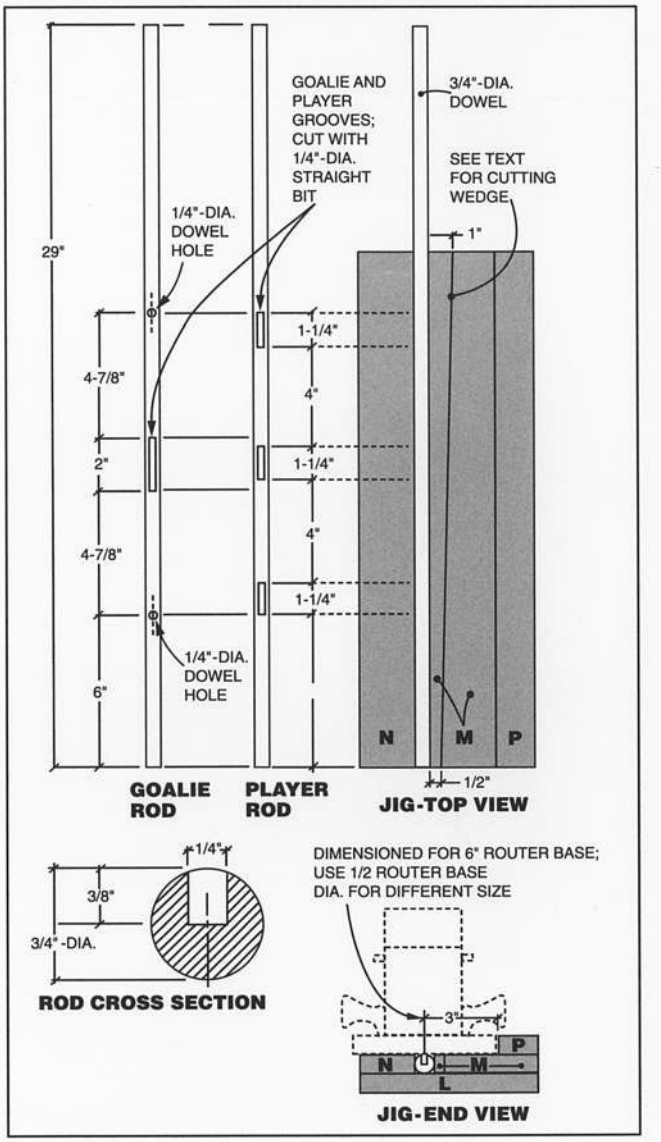
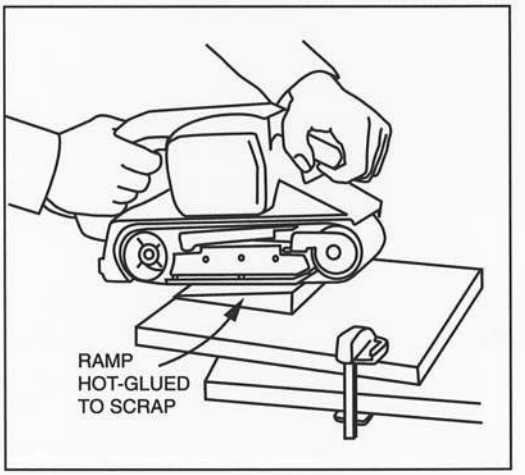


FIG D. MAKING THE RAMPS



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